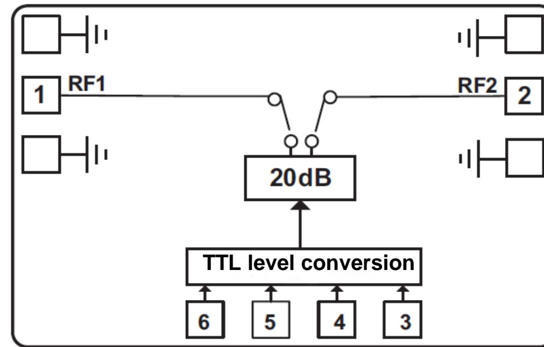
GaAs pHEMT MMIC
1-Bit Digital Control Attenuator
8-12GHz

Features

- Integrated TTL level conversion circuit
- Attenuation Range: 21dB
- Attenuation Accuracy: ±0.6dB
- Insertion Loss: 1dB
- Impedance: 50Ω
- Die Size: 1.3 x 1.0 x 0.1 mm

Functional Block Diagram



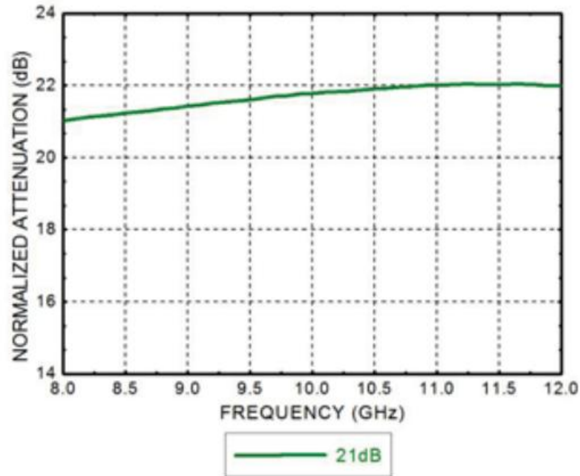
Typical Applications

- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

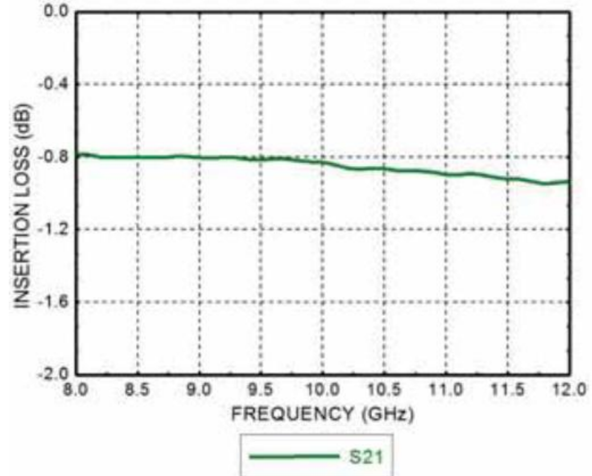
Electrical Specifications

TA = +25°C, Vctl = 0/5V

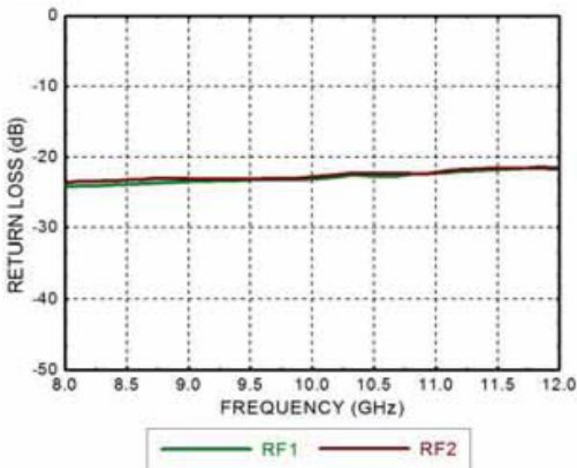
Parameters	Min.	Typ.	Max.	Units
Frequency		8-12		GHz
Insertion Loss		1		dB
Attenuation Range		21		dB
Return Loss		20		dB
Input 1dB Compression (P1dB)		24		dBm
Switching Speed		50		ns



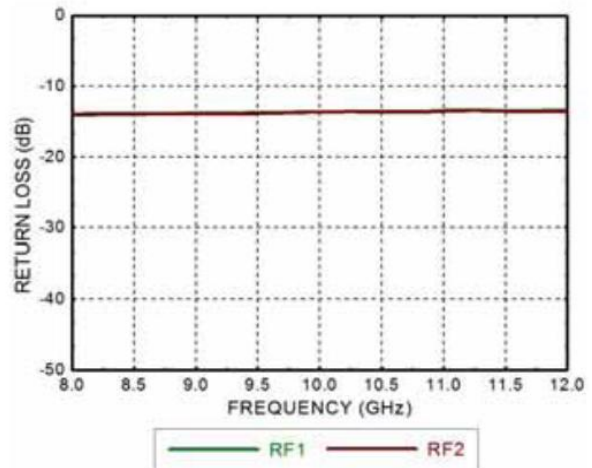
Attenuation
NORMALIZED ATTENUATION (dB)
24
22
20
18
16
14
8.0
8.5
9.0
9.5
10.0
10.5
11.0
11.5
12.0
FREQUENCY (GHz)
21dB



Insertion Loss
INSERTION LOSS (dB)
0.0
-0.4
-0.8
-1.2
-1.6
-2.0
8.0
8.5
9.0
9.5
10.0
10.5
11.0
11.5
12.0
FREQUENCY (GHz)
S21



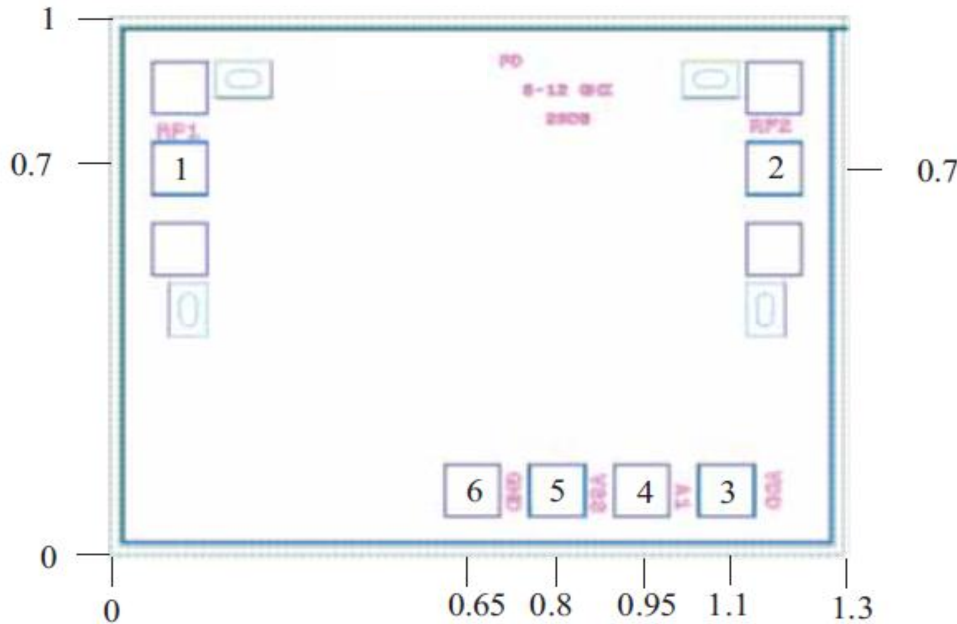
Return Loss
RETURN LOSS (dB)
0
-10
-20
-30
-40
-50
8.0
8.5
9.0
9.5
10.0
10.5
11.0
11.5
12.0
FREQUENCY (GHz)
RF1
RF2



Attenuation Return Loss
RETURN LOSS (dB)
0
-10
-20
-30
-40
-50
8.0
8.5
9.0
9.5
10.0
10.5
11.0
11.5
12.0
FREQUENCY (GHz)
RF1
RF2

Outline Drawing:

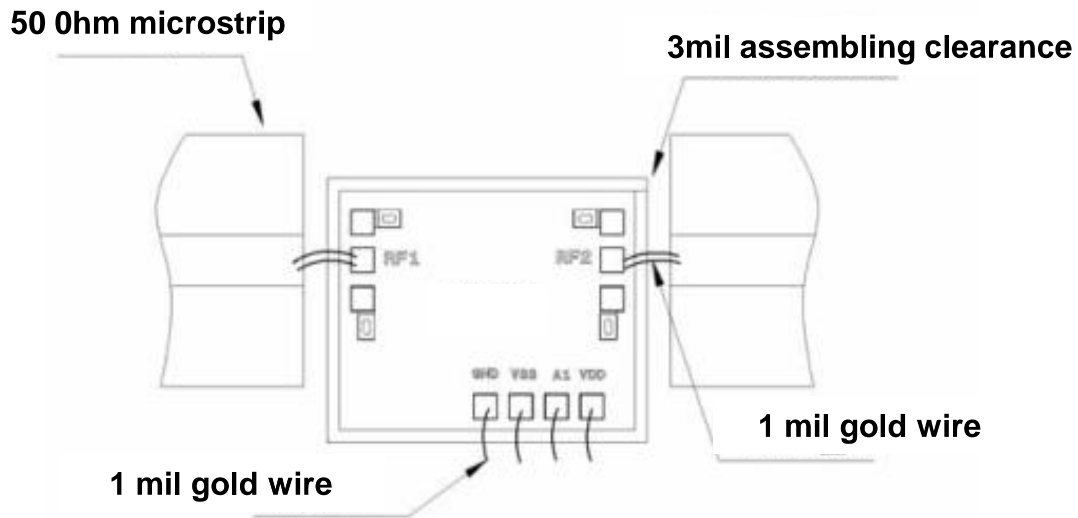
All Dimensions in mm



Pad Description

PAD	Function	Description
1,2	RF1,RF2	This pad is RF port and matched to 50Ω Impedance.
3	VDD	This pad is the TTL control circuit ESD power supply, and the +5V voltage.
4	A1	This pad is the control signal input terminal, A1=0V is the ground state, and A1=5V attenuation 21dB.
5	VSS	This pad is TTL control circuit power supply, and then -5V power supply.
Die Bottom	GND	Die bottom must be connected to RF/DC ground.

Assembly Drawing



Notes:
1. Die thickness: 100um
2. Typical bond pad is 100*100 μm^2
3. Bond pad metalization: Gold
4. Backside metalization: Gold
5. Backside of the die (GND)
6. No connection required for unlabeled bond pads

Maximum Ratings:
1. RF input power: +24dBm
2. Storage temperature: -65℃ to +175℃
3. Operating temperature: -55℃ to +85℃